

CLAIMS

What is claimed is:

- 5        1. A method of identifying an individual who will benefit from treatment with fructosamine oxidase inhibitors or antagonists comprising testing an individual for a level of fructosamine oxidase activity and determining whether the level of fructosamine oxidase activity is in a normal range.
- 10        2. The method of claim 1 wherein levels of fructosamine oxidase activity are measured in blood, plasma, or serum from the individual.
- 15        3. The method of claim 1 wherein levels of fructosamine oxidase activity are measured by the levels of superoxide reaction product of fructosamine oxidase activity.
- 20        4. The method of claim 1 wherein levels of fructosamine oxidase activity are measured by the levels of oxygen free radical product of fructosamine oxidase activity.
- 25        5. The method of claim 1 wherein the individual is diabetic.
6. The method of claim 1 wherein the individual is pre-disposed to diabetes.
7. The method of claim 1 wherein the individual is at risk to develop vascular damage associated with elevated levels of fructosamine oxidase.
8. The method of claim 7 wherein an individual's risk for vascular damage comprises determining the level of fructosamine oxidase activity in a sample from the

individual and determining whether the level of fructosamine oxidase is in a normal range.

9. A method for determining whether an individual is at risk for a disease state associated with an abnormality in levels of fructosamine oxidase activity comprising obtaining a sample from the individual, measuring the level of fructosamine oxidase activity, and determining whether the level of fructosamine oxidase is in a normal range.
10. The method of claim 9 wherein said sample is blood, plasma, or serum.
11. The method of claim 9 wherein the disease state is diabetes.
12. The method of claim 9 wherein the disease state is vascular damage.
13. The method of claim 9 wherein the individual is diabetic.
14. The method of claim 9 wherein the individual is pre-disposed to diabetes.
15. A method of identifying fructosamine oxidase inhibitors or antagonists comprising testing a candidate substance and measuring the effect a candidate substance has on fructosamine oxidase activity.
16. The method of claim 15 wherein the candidate substance is selected from the group consisting of quinone co-factor, copper co-factor, and substrate analogue of fructosamine oxidase.
17. The method of claim 15 wherein the candidate substance inhibits or antagonizes fructosamine oxidase activity and has specificity for fructosamine oxidase.

18. The method of claim 15 wherein the fructosamine oxidase activity is measured by an absorbance change or chemiluminescent change.
- 5        19. The method of claim 15 wherein the fructosamine oxidase activity is determined by measuring levels of superoxide reaction product or oxygen free radical product of fructosamine oxidase activity.
- 10      20. A composition comprising the fructosamine oxidase inhibitor or antagonist of claim 15.
- 15      21. A method of treating an individual at risk for disease states associated with elevated levels of fructosamine oxidase activity comprising administering the fructosamine oxidase inhibitor of claim 15.
- 20      22. The method of claim 21 wherein the disease state is diabetes.
- 25      23. The method of claim 21 wherein the disease state is vascular damage.
26. The method of claim 21 wherein the individual is diabetic.
27. The method of claim 21 wherein the individual is pre-disposed to diabetes.
28. The method of claim 21 wherein the levels of fructosamine oxidase activity are monitored by obtaining at least one blood or serum sample from the individual and testing the sample for levels of fructosamine oxidase activity.

27. A method of determining a level of fructosamine oxidase activity comprising measuring conversion of a substrate to a product by fructosamine oxidase.
28. The method of claim 27 wherein the conversion is measured by determining a level of superoxide reaction product.
29. The method of claim 27 wherein the conversion is measured by determining a level of oxygen free radical product.
30. The method of claim 27 wherein a superoxide scavenging mechanism is disabled.
31. The method of claim 27 wherein a superoxide scavenging mechanism is disabled prior to the exposure to a suitable fructosamine oxidase substrate.
32. The method of claim 31 wherein the fructosamine oxidase substrate is glycated bovine serum albumin.
33. The method of claim 32 wherein the glycated bovine serum albumin is modified to eliminate copper chelating activity.
34. The method of claim 27 wherein measurements are made at a pH of 7 to 8.
35. The method of claim 27 wherein measurements are made at a pH greater than 7.5.

36. A composition of a blood or serum sample wherein a fructosamine oxidase substrate is glycated bovine serum albumin which has been modified to eliminate copper chelating activity.